

Title Quality assessment of grain samples using spectra analysis
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Abstract

Approaches, methods and tools for assessment of the main quality features of grain samples using spectra analysis of the sample elements are presented. The sample elements were divided in the following quality groups: grains with inherent colour for the variety, back side; grains with inherent colour for the variety, germ side; heat-damaged grains; green grains, mouldy grains; smutty grains, infected (with *Fusarium*) grains, sprouted grains, and non-grain impurities. Three different approaches were used for feature extraction from spectra and for data dimensionality reduction: principal component analysis (PCA) and combinations of two kinds of wavelet descriptions and PCA. Three classifiers, based on radial basis elements, were used for object classification in quality groups. The validation, training and testing errors of the grain sample elements classification were evaluated. The results obtained using the developed platform were compared with the results obtained by the Unscrambler reference platform.